



RESEARCH DEPARTMENT

Transmitting aerials for the Perth v.h.f. television and v.h.f. sound station

TECHNOLOGICAL REPORT No.E - 113

1964/81


**THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION**

RESEARCH DEPARTMENT

**TRANSMITTING AERIALS FOR THE PERTH V.H.F. TELEVISION
AND V.H.F. SOUND STATION**

Technological Report No. E-113
(1964/81)

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(G.G. Gouriet)

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TRANSMITTING AERIALS FOR THE PERTH V.H.F. TELEVISION AND V.H.F. SOUND STATION

INTRODUCTION

The Perth relay station came into operation on 26th October 1964. It provides a television and v.h.f. sound service to the town of Perth only.

SUMMARY OF INSTALLATION

Site: The site is at Kinnoull Hill about $1\frac{1}{4}$ miles (2.0 km) east of Perth town centre, grid reference NO/131232, height 400 ft (122 m) a.m.s.l.

Support Structure: The support structure consists of a 47 ft (14.3 m) wooden pole. A similar pole spaced 96 ft (29 m) on a bearing of 270° ETN from the transmitting aerial pole is used to support the receiving aerials.

General Arrangement: See Fig. 1.

Band I

Channel: Channel 4 with vertical polarization is used. Both vision and sound carriers are offset $+16.875$ kc/s.

Aerial: The aerial¹ consists of a single vertical 3-element Yagi oriented to give maximum radiation on a bearing of 275° ETN. The mean height is 47 ft (14.3 m) a.g.l.

Power: A translator with an output power of 10 W is used.

Templet and Horizontal
Radiation Pattern
(h.r.p.)

See Fig. 2 and Note 1.

Gain:	Mean intrinsic and net gain	0.1 dB
	<u>Deduct:</u> loss in feeder (type RPC 2603)	0.9 dB
	network loss	0.6 dB 1.5 dB
	Mean effective gain	<u>-1.4 dB</u>

Band II

Carrier Frequencies: 89.3 (Light), 91.5 (Third), 93.7 (Scottish Home) Mc/s. The aerial¹ consists of two tiers each of two horizontal $\lambda/2$ dipoles mounted on bearings of 243° and 333° ETN, spaced 3 ft 9½ in (1.16 m) from the wooden support pole axis and fed with equal co-phased currents. The inter-tier spacing is 0.5λ and the mean height is 34 ft (10.4 m) a.g.l. There are independent main feeders to each tier.

Power: A translator with an output power of 10 W is used.

Templet and h.r.p.: See Fig. 3 and Note 2.

Gain:	Mean intrinsic gain	0.2 dB
	<u>Deduct:</u> loss due to possible misalignment and distribution feeders	0.2 dB
	Mean net gain	0 dB
	<u>Deduct:</u> loss in main feeder (type RPC 2603)	1.0 dB
	network loss	0.9 dB 1.9 dB
	Mean effective gain	<u>-1.9 dB</u>

Programme Links: Both television and sound programmes are obtained by direct pick-up of the transmissions from Kirk o' Shotts.

- Notes:
1. The aerial design was based on the use of a Yagi aerial of the type used for re-broadcast reception (r.b.r.) and for which the h.r.p. was known from previous measurements.
 2. The h.r.p. shown in Fig. 3 was determined from measurements on a small-scale model of the aerial.

REFERENCE

Detailed information on the construction and dimensions of the aerials is given on the following drawings prepared by BBC Planning and Installation Department:

P.I.D. 9113.2.1A. Arrangement of transmitting aerials on wooden pole.

P.I.D. 9113.2.2A. Arrangement of r.b.r. aerials on wooden pole.

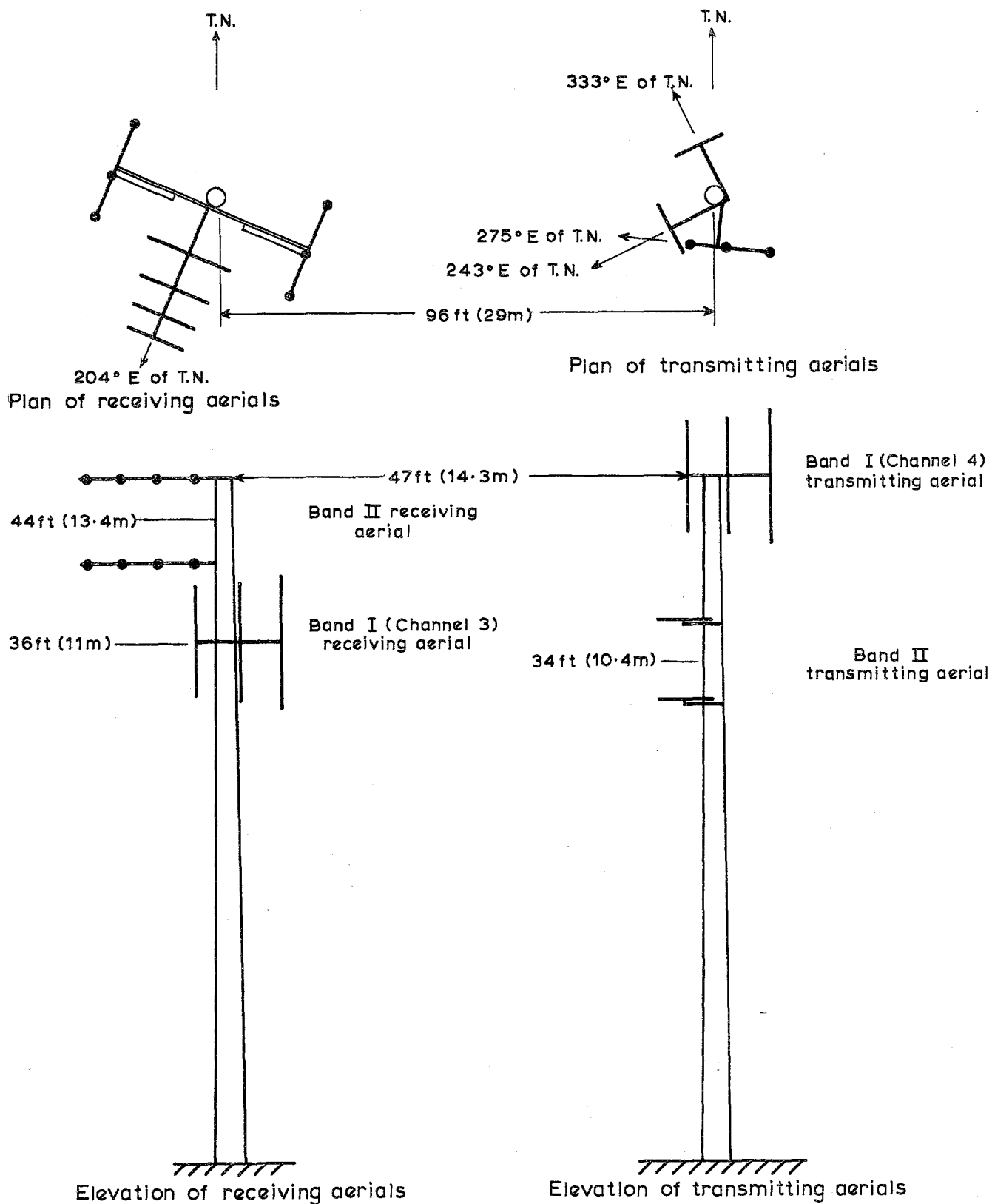


Fig.1. General arrangement of aerials on wooden support poles.

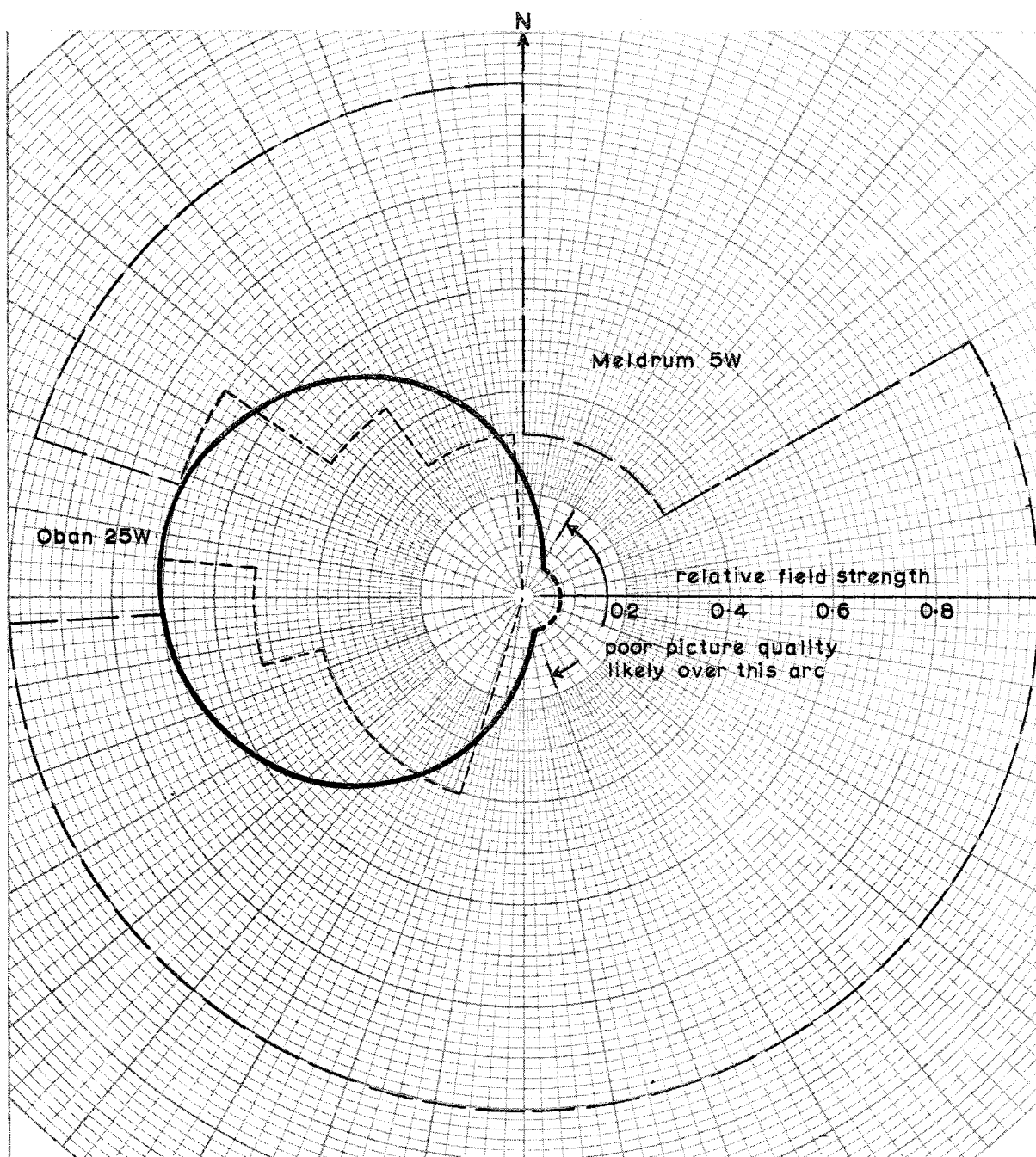


Fig.2. Band I templet and horizontal radiation pattern
VERTICAL POLARIZATION

Channel 4 (Vision carrier 61.75Mc/s, Sound carrier 58.25Mc/s)
 Mean effective gain -1.4dB
 Transmitter power 10W
 Mean E.R.P. 7.2W

————— Maximum permissible E.R.P.
 ----- Minimum desirable E.R.P.

Unit field corresponds to an E.R.P. of 50W

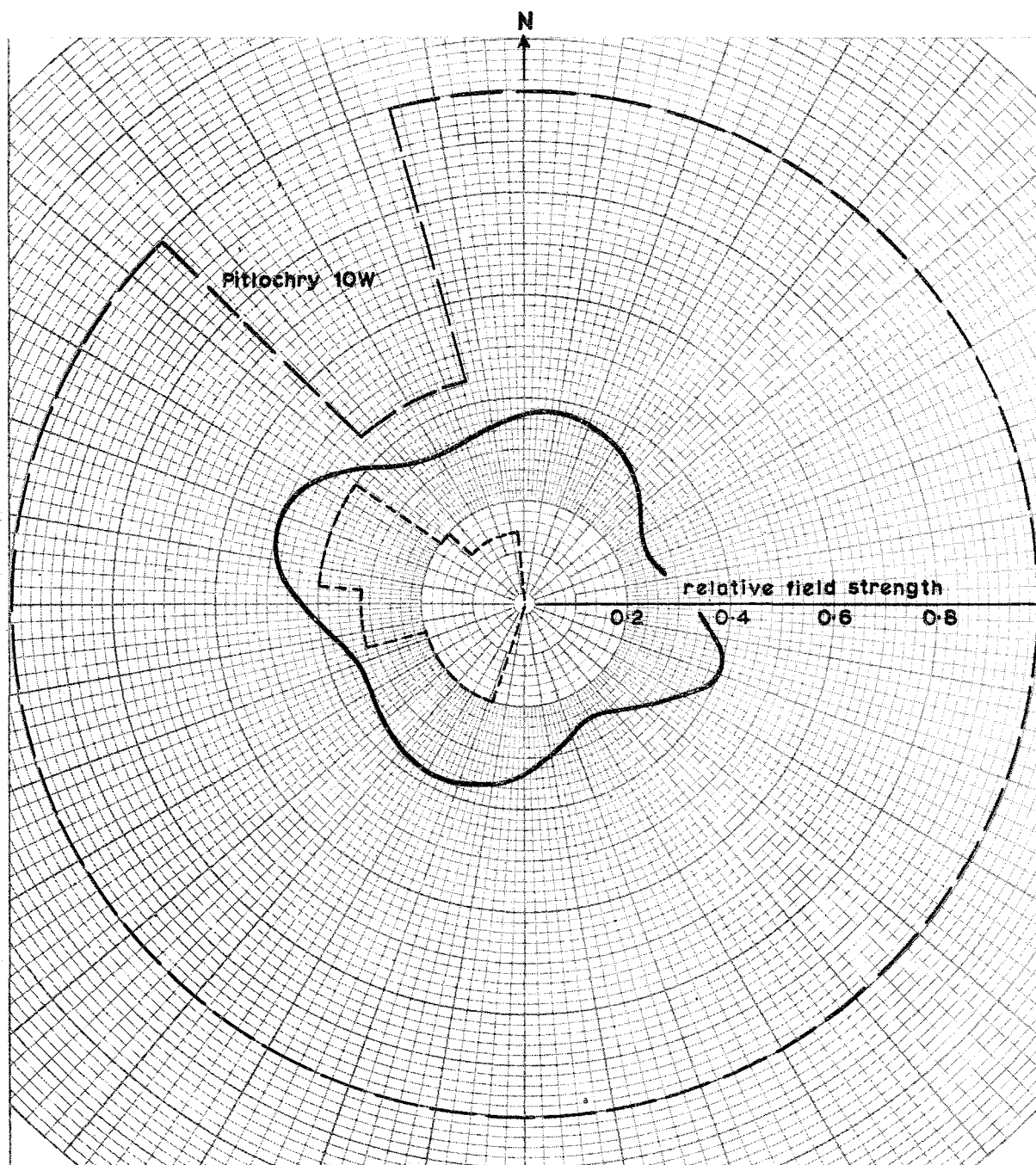


Fig. 3. Band II templet and horizontal radiation pattern

HORIZONTAL POLARIZATION

89.3 (Light), 91.5 (Third), 93.7 (Scottish Home), Mc/s

Mean effective gain -1.9 dB

Transmitter power 10W

Mean E.R.P. 6.5W

————— Maximum permissible E.R.P.

----- Minimum desirable E.R.P.

Unit field corresponds to an E.R.P. of 50W